

DOCUMENT RESUME

ED 043 460

RP 002 945

AUTHOR Keetz, Mary A.  
TITLE An Experimental Investigation of the Effectiveness of A College Reading and Study Skills Course for Freshmen Students Enrolled in Scientific Courses of Study.  
PUR DATE May 70  
NOTE 7p.; Paper presented at the International Reading Association conference, Anaheim, Cal., May 6-9, 1970  
EDRS PRICE MF-\$0.25 HC-\$0.45  
DESCRIPTORS Adult Reading Programs, \*College Freshmen, \*College Programs, Course Evaluation, Experimental Programs, Performance Factors, \*Program Effectiveness, \*Reading Programs, \*Reading Research, Science Instruction, Study Skills

ABSTRACT

An investigation was undertaken to evaluate the effectiveness of a reading and study skills program for students taking a great number of courses that require quantitative reasoning, as well as other skills. Subjects were 53 freshmen enrolled at the Philadelphia College of Pharmacy and Science. All of the subjects had failed one or more courses. A battery of reading and study skills tests was administered to all subjects, and, based on test results, students were divided into experimental and control groups. The course included 13 sessions. Effectiveness of the course was determined by comparing the two groups on the various criterion measures employed in the study. Results showed no statistically significant differences between the groups in reading rate and comprehension of usual college materials, comprehension of science materials, and ability to read and study a textbook assignment. Several educational implications are pointed out, and references are included. (NH)

ED043460

An Experimental Investigation of the Effectiveness of  
A College Reading and Study Skills Course for  
Freshmen Students Enrolled in Scientific  
Courses of Study<sup>1</sup>

U.S. DEPARTMENT OF HEALTH, EDUCATION  
& WELFARE  
OFFICE OF EDUCATION  
THIS DOCUMENT HAS BEEN REPRODUCED  
EXACTLY AS RECEIVED FROM THE PERSON  
ORGANIZATION ORIGINATING IT. POINTS  
VIEW OR OPINIONS STATED DO NOT NEC-  
ESSARILY REPRESENT OFFICIAL OFFICE OF ED-  
UCATION POSITION OR POLICY

The Problem

The purpose of this investigation was to evaluate the effectiveness of a reading and study skills course for students enrolled in scientific courses of study. It was undertaken to better understand certain factors related to a reading and study skills program for students taking a great number of courses that require quantitative reasoning, as well as other skills. If such information were available, more appropriate instruction could be offered to these students and to other students who take courses of a quantitative nature while working toward degrees in more verbal curricula.

Procedures

Fifty-three freshmen who were enrolled at the Philadelphia College of Pharmacy and Science during the second semester of the 1966-67 academic year participated in the study. The students were selected because their first-semester grade averages were below 67.00. All of the students had failed one or more subjects.

Fifty-eight students were originally chosen as participants. However, after the study began, it was discovered that five of the students had enrolled in a reading improvement course the previous summer. Although the five students were excluded from the statistical analyses, they were used in the formation of the verbal aptitude levels.

BE002 945

---

<sup>1</sup> Paper presented by Mary A. Keetz at Fifteenth Annual Convention for the International Reading Association.

Each student's verbal aptitude score (SAT-V) on the College Entrance Examination Board's Scholastic Aptitude Test (1) was obtained from the Dean's office. The 58 SAT-V scores were then ranked from the lowest to the highest. Three levels of SAT-V were formed by the "counting-off method (3)." The students at each level were then assigned randomly to the experimental and control groups. This meant there were 29 subjects in each of the two treatment groups before the 5 students were eliminated from the study.

Since 3 of the 5 students excluded from the study were in the experimental group, the experimental group was made up of 26 students. Of these 26 students, 8 were in the high SAT-V level, 10 in the middle level, and 8 in the low level. The control group, on the other hand, was composed of 27 students. Of these 27 students, 8 were in the high SAT-V level, 10 in the middle level, and 9 in the low level.

A battery of reading and study skills tests was administered to each student participating in the study. Two standardized reading tests were administered before and after the reading and study skills course; whereas, an informal reading and study test was administered only after the course ended.

Data concerning the first- and second-semester academic achievement of each student were obtained from the Dean's office. Two grade averages for each of the semesters were computed for each student participating in the study: (1) his grade average for verbal-type courses (biology, English, and philosophy), and (2) his grade average for quantitative-type courses (chemistry and mathematics).

The reading and study skills course was offered to the experimental subjects as a group. There were thirteen sessions in all. During the class periods, certain reading and study skills were taught to and practiced by the students. Most of the instructional materials were taken from the students' course textbooks. The Study Habits Checklist (5) was administered during the first class period. It was then used as a basis for personal conferences which were held at the beginning of the course and again after instruction ended.

The effectiveness of the reading and study skills course was determined by comparing the experimental and control groups on the various criterion measures employed in the study. Analysis of covariance was applied to the pre- and post-scores of the standardized reading tests and to the first- and second-semester grade averages for verbal- and quantitative-type courses. Analysis of variance was utilized to analyze the results of the informal measure since it was administered only as a post-measure. The .05 level of confidence was used to determine the statistical significance of the effects.

Coefficients of correlation were computed in order to show the relationship of each criterion with the other criteria used in the study. The .05 level of statistical significance was also used to evaluate these intercorrelations.

#### Findings and Conclusions

##### Reading and Study Skills

Three tests were administered to the experimental and control groups in order to determine the effectiveness of the experimental treatment with respect to reading and study skills. The Davis Reading Test (2), Forms 1C and 1D, was administered as a pre- and post-measure of the students' level of comprehension and speed of comprehension of the variety of materials college students are expected to read. Interpretation-Natural Sciences (4), Forms X-3S and Y-3S, was administered as a pre- and post-test of the students' ability to comprehend science materials. One form of the "Informal Reading and Study Test" was administered after the experimental treatment ended. This test was especially constructed for the investigation by the investigator as a measure of the students' ability to read and study a textbook assignment.

There were no statistically significant differences between the experimental and control groups with respect to the following reading and study skills: (1) level of comprehension of the variety of materials college students are expected to read, (2) speed of comprehension of the variety of materials college students are expected to read, (3) comprehension of science materials, and (4) ability to read and study a textbook assignment.

These findings indicate that the experimental treatment did not result in improved reading and study skills when students enrolled in science curricula are "blocked" according to verbal aptitude scores (SAT-V). It may be that some other control variable would result in a more sensitive statistical test of the treatment effect.

On the other hand, it should be noted that science comprehension as measured by the Interpretation-Natural Sciences test was not an accurate measure of the students' ability to understand what they read since many students were not able to finish the test in the time allowed. In other words, the science comprehension test measured the students' speed of comprehension, not their level of comprehension.

These findings indicate two things: (1) many of the students participating in the study read science materials at a very slow rate, and (2) there is a need for developing tests that are valid measures of the reading skills being tested.

#### Academic Achievement

There were no statistically significant differences between the experimental and control groups with respect to grade-point average in verbal- or quantitative-type courses during the semester in which the reading and study skills course was offered.

These findings indicate that the experimental treatment did not result in improved academic achievement in either verbal- or quantitative-type courses during the semester in which the experimental treatment was offered when the students enrolled in science curricula are "blocked" according to verbal aptitude scores (SAT-V). Perhaps a more sensitive statistical test would have resulted if the subjects were "blocked" according to a control variable other than verbal aptitude scores.

Three reasons help to explain the lack of significant differences between the two treatment groups with respect to academic achievement. First, other factors may have had a greater influence on academic achievement. These factors appear to be intangible qualities such as attitudes, interest, and level of aspiration. The second reason is that the actual influence of the experimental treatment may not be manifested in academic achievement until later. That is, academic achievement

should be measured for later semesters as well as for the semester in which the experimental treatment was offered. The third reason may be that the relatively small size of sample produced a relatively unpowerful statistical test.

#### Relationships among the Criterion Measures Employed in the Study

Four of the twenty correlations among the criterion measures employed in the study were found to be statistically significant. These four relationships were: (1) .31 between level of comprehension of general materials as measured by the Davis Reading Test and verbal aptitude (SAT-V) at the .05 level, (2) .31 between speed of comprehension of general materials as measured by the Davis Reading Test and verbal aptitude (SAT-V) at the .05 level, (3) .41 between science comprehension as measured by the Interpretation-Natural Sciences test and level of comprehension of general materials as measured by the Davis Reading Test at the .01 level, and (4) .62 between science comprehension as measured by the Interpretation-Natural Sciences test and speed of comprehension of general materials as measured by the Davis Reading Test at the .01 level. The remaining correlations involving each of the two grade averages (verbal and quantitative courses) and the "Informal Reading and Study Test" were low and, in some cases, negative.

The relationship between specific reading ability (science comprehension as measured by the Interpretation-Natural Sciences test) and general reading ability (level of comprehension as measured by the Davis Reading Test) is in accordance with previous research findings that have reported moderate to high correlations. Perhaps the degree of relationship would have been higher if the science test had been a measure of the students' level of comprehension instead of their speed of comprehension. Nevertheless, it can be concluded from the correlation that a degree of specificity exists in the ability to read science materials apart from that due to general reading ability.

The relationship between specific reading ability, science comprehension, and speed of comprehension of general materials (as measured by the Davis Reading Test) was quite high. Previous studies have reported much lower correlations between these two criterion measures. The high

relationship found in this study is partially attributable to two factors: (1) the particular nature of the population; namely, students majoring in scientific courses of study, and (2) the questionable validity of the science reading test used in the study.

The low and negative relationships found between each of the two grade averages (verbal and quantitative courses) and each of the various measures of reading ability indicate that factors other than reading ability are more important to academic achievement. However, it may be that the magnitude of the contribution of reading ability to academic achievement was hidden by the questionable validity of the testing devices used in the study. This is particularly true in the case of the test used to measure science comprehension.

As to the "Informal Reading and Study Test," low and negative correlations were found between it and each of the other reading measures. These findings indicate that the test is measuring different skills than those measured by conventional, standardized reading tests. However, as important as the ability to grasp the main ideas of a textbook assignment is to academic achievement, there apparently is little relationship between the two factors as measured in this study.

#### Educational Implications

The present investigation points out three important aspects of college reading and study skills courses: (1) reading instruction is not always followed immediately by improved reading performance and higher academic grades; (2) reading instruction for students enrolled in scientific courses of study needs further examination; and (3) there is a need to develop improved measures of reading skills for students in science curricula.

This study also points up the urgent need to develop valid measures of reading ability. A review of the research in this area indicates the questionable validity of standardized reading tests. However, investigators continue to employ these measures in judging the effectiveness of college reading programs. The use of such tests may prevent the accurate evaluation of reading improvement programs and obscure the true relationships that exist among the criterion measures employed as part of the

instructional programs. Since this was true in the present investigation, it appears that the accurate evaluation of a college reading program is not possible until more valid measures of reading ability are developed.

#### REFERENCES

1. College Entrance Examination Board. Scholastic Aptitude Test. Princeton; Educational Testing Service, 1965.
2. Davis, Frederick B., and Charlotte Croon Davis. Davis Reading Test. New York; The Psychological Corporation, 1957.
3. Lindquist, E. F. Design and Analysis of Experiments in Psychology and Education. Boston; Houghton Mifflin Company, 1953. Chapter 5.
4. \_\_\_\_\_ (ed.). Interpretation-Natural Sciences. Test 6 of the Iowa Tests of Educational Development. Chicago; Science Research Associates, Inc., 1952.
5. Preston, Ralph C., and Morton Botel. Study Habits Checklist. Chicago; Science Research Associates, 1957, 1967.